

S.T.O.P (Stop Trashing Our Planet): A Comparison Between an Urbanized and a Non-urbanized Beach

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Introduction

Marine debris is any object that has been disposed of in the coastal or marine environment. Wind and ocean currents move the debris to different places, and many have been found on our coastal shore. The trash being found is not only left by beachgoers, but it can also be caused by storm water runoffs, ships or vessels, and even industrial facilities. Marine debris impacts our environment and endangers marine life, and also poses a hazard to human health.

Beaches usually have garbage cans, but they are not always conveniently close to people. When garbage cans are not within people's reach, their natural instinct is to leave trash on the beach.

In order to determine the amount of garbage found on the beaches, we chose Palm and Seacliff Beach to be our testing sites. Palm Beach is more isolated from the city, and the garbage cans are in inconveniently and far locations. Whereas, Seacliff is more urbanized with buildings, and numerous garbage cans nearby. We hope to encourage future students as well as families to stop littering, not only in the coastal and oceanic marine ecosystems, but in school as well.



A = Seacliff Beach

B = Palm Beach

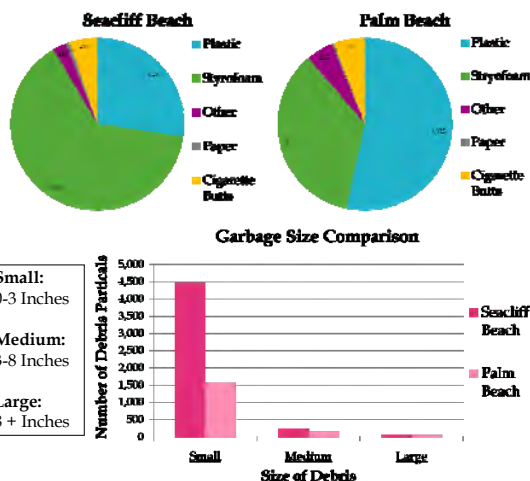
Materials and Methods

In order to show the effects caused by marine debris on urbanized and non-urbanized beaches, we decided to sample two beaches by picking up trash and analyzing the data we collected. For our project, we chose Palm Beach and Seacliff Beach as our testing site. We visited both beaches four times, and spent about 2-3 hours collecting trash.

- Using a measuring tape, we measured an area of 250 feet by 250 feet to be our testing area.
- Inside the 250 feet by 250 feet area, we collected garbage from the surface using gloves and a garbage bag.
- We started near the berm, sampling parallel to the swash zone until we covered the entire sample area.
- Once completed, we brought the garbage bags and the materials back to school in order to categorize, size, and count them using rulers and checklists.

Results

In our project we collected debris that was found on the surface of our tested beaches. The amount of trash increased as we moved closer to the berm, and decreased as we moved towards the swash zone. Palm Beach was the non-urbanized beach with no garbage cans near by, while Seacliff Beach, is an urbanized beach that contains garbage cans. We found greater amounts of small debris particles compared to big debris, and we believe that the debris was washed up by ocean currents and tides. Most if not all of our collected debris was fragments that decomposed over time, while drifting on ocean currents. These small pieces of marine debris were deposited by the tides along with the kelp. We found that the most common debris among both beaches was Styrofoam, plastics, and cigarette butts. Palm Beach had more plastics than Styrofoam while Seacliff Beach had more Styrofoam than plastic.



Discussion

The most commonly found debris on both of the beaches was plastic and Styrofoam. The amount of Styrofoam found was unexpected. We believe that the majority of the trash found on the beach was not disposed locally by visitors to the beach, but brought up by ocean currents and left by the tides. Since most of what we found was small fragments of debris. However, Seacliff Beach is closer to urban areas and still contained more trash than Palm Beach, which is farther from urban areas. This could have been caused by more people visiting Seacliff rather than Palm Beach, but the major effect of the high amount of trash found on the beach was because of the El Niño weather. The amount of trash increased dramatically as the sudden heavy rainfalls and runoffs.



Conclusion

For our data, we concluded that the weather was a major obstacle while collecting our data because of a sudden El Niño weather change. It brought more rainfall and bigger waves which affected the amount of marine debris being washed up. On the days we tested Seacliff Beach, it always had more trash than Palm Beach. Another observation we noticed was that both beaches always had more trash near the berm than the swash zone. Factors such as spring tides and wind could possibly explain why more trash is found closer to the berm. Our project was taken place during the winter; therefore, results may vary depending on the season. We want to share our information with our peers and our community. We will be presenting our findings to the alumni and families at Pajaro Valley Middle School, and teach them about marine debris and the cause and affects it has on our oceans.

We hope to encourage many people to pick up after themselves. Our goal is to show people how much small trash is being found, so that they will not only think about the big trash, but the small trash as well. The small trash is very important because it may be harming our environment and our marine life. If everyone picks up a small piece of trash it would make a huge impact.



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